EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for January and February 2004 -- comparing the performance against the requirements from BAH, including Terra, TRMM, and QuikScat, Aqua, ADEOS II, Aura, SAGE III, and ICESat requirements

Up to date graphical results can be found on the NEW EOS network performance web site (now pretty stable): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the individual site links below.

Note that the previous report in this series was for August – September '03. Comparisons described below relate to that period.

Highlights:

- Mostly stable performance.
- The FY '04 requirements are now used as the basis for the ratings.
- ADEOS 2 requirements have NOT been removed at this time

Change History:

- February 2003: Another requirements update from BAH– no major changes
- December 2002: Updated to latest BAH requirements, based on Handbook v1.2. Includes additional missions.
- June 2001: The requirements were modified to incorporate an updated number of EOS funded users at each tested site, based on the latest SPSO database. The total number of users increased in this way from 434 to 1012 (US only).
- May 2001: The requirements were increased by adding a 50% contingency factor to all QA and SIPS requirements, which were omitted with the change to the new BAH requirements in March 2001.

Ratings:

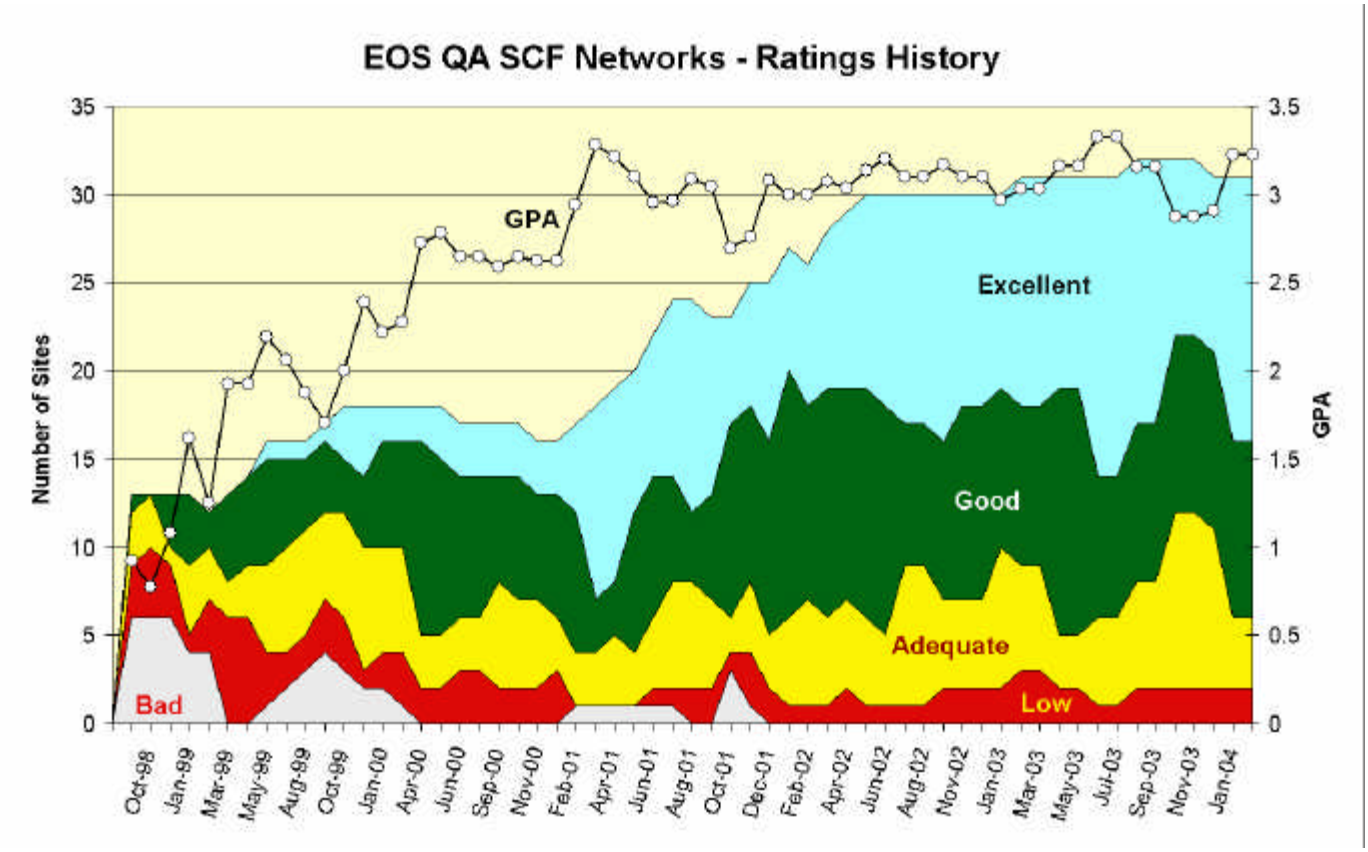
Rating Categories:

Excellent: median of daily worst cases > 3 x requirement
Good: median of daily worst cases > requirement

Adequate: median of daily worst cases < requirement
and
median of daily medians > requirement

Low: median of daily medians < requirement.
Bad : median of daily medians < 1/3 of the requirement.

The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Ratings Changes:

Upgrades: ↑

Miami: Adequate → **Excellent**
PNNL: Good → **Excellent**
UCL: Adequate → **Excellent**

Downgrades: ↓

Arizona: Excellent → **Good**
LANL: Excellent → **Good**
JRC: Excellent → **Good**
Ohio State: Good → **Adequate**

Testing Stopped:

RSS: was **Adequate** (host down – replacement sought)

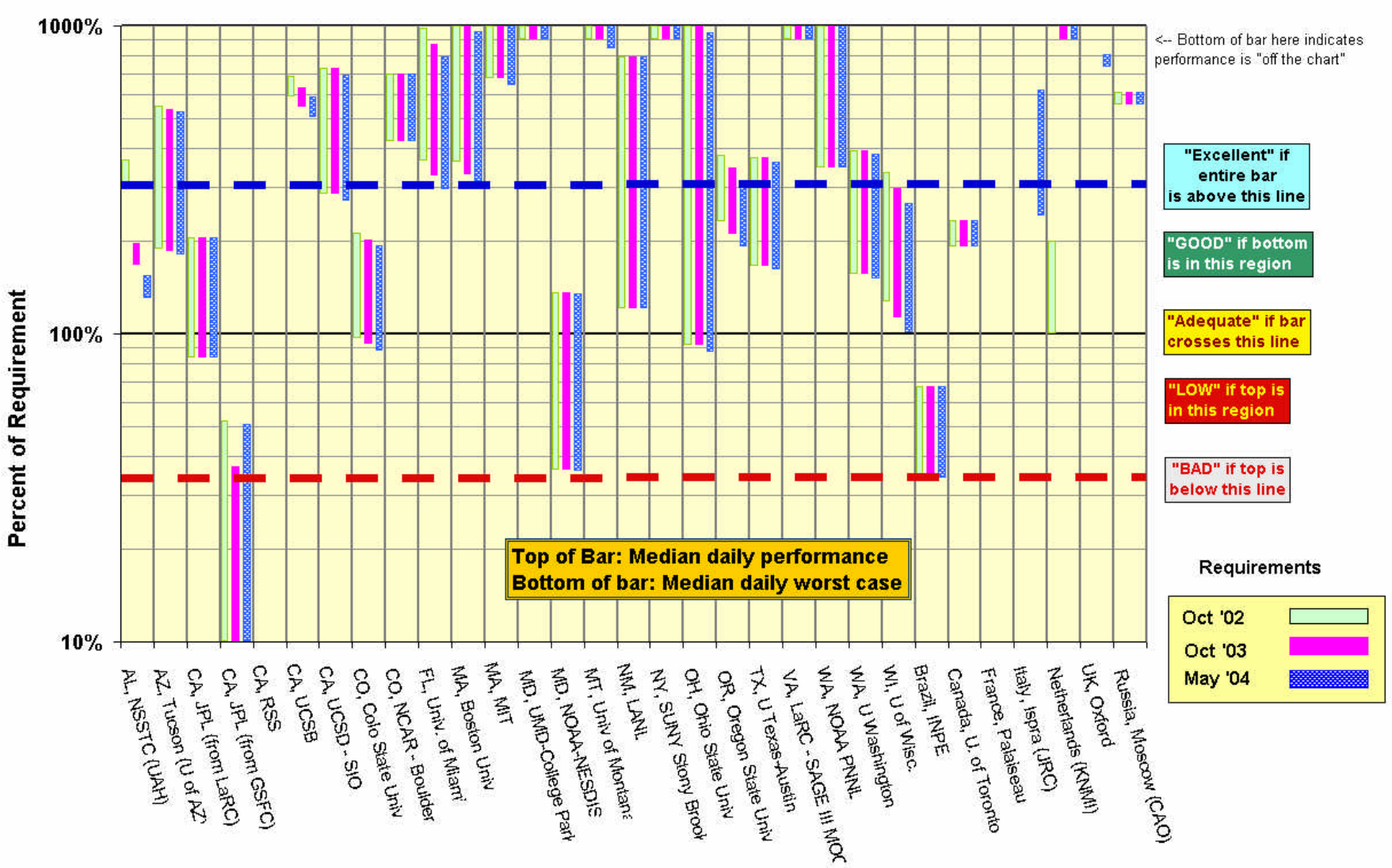
EOS QA SCF Sites: Network Requirements vs. Measured Performance

Jan - Feb 2004		Requirements (kbps)			Testing							
Destination	Team (s)	Previous: Oct-02	Current: Oct-03	Future: May-04	Source Node	Median kbps	Median Daily Worst	Rating re Current Requirements Oct-03	Prev	Rating re May-04	Route Tested	Upgrade
AL, NSSTC (UAH)	CERES, AMSR-E	2629	4878	6236	LaTIS	9624	8134	GOOD	G	GOOD	NISN + FDDI	
AZ, Tucson (U of AZ)	MODIS, MISR	2689	2750	2811	EDC	14782	5078	GOOD	E	GOOD	Abilene via MAX	
CA, JPL (from LaRC)	MISR	18484	18484	18484	LDAAC	38034	15474	Adequate	A	Adequate	EMSnet	
CA, JPL (from GSFC)	AIRS, TES, others	17612	24798	18088	GDAAC	9203	1099	LOW	L	LOW	NISN SIP	Increase VC
CA, RSS	AMSR-E	1156	1926	2696	JPL-PODAAC				A		2 * T1 - Consolidated	
CA, UCSB	MODIS	2681	2903	3126	GDAAC	18363	15811	Excellent	E	Excellent	Abilene via MAX	
CA, UCSD - SIO	ICESAT, CERES	6478	6478	6792	GSFC-ICESAT	47165	18360	GOOD	G	GOOD	Abilene via NISN / MAX	
CO, Colo State Univ	CERES	1952	2049	2147	LaTIS	4150	1892	Adequate	A	Adequate	NISN -> Abilene	host interface
CO, NCAR - Boulder	MOPITT, HIRDLS	2438	2438	2438	LaRC DAAC	17044	10227	Excellent	E	Excellent	NISN -> Abilene	
FL, Univ. of Miami	MODIS, MISR	15158	16991	18823	GDAAC	148751	55272	Excellent	A	GOOD	Abilene via MAX	
IL, UIUC	MISR	1133	1133	1133								
MA, Boston Univ	MODIS, MISR	2528	2781	3035	EDC DAAC	29039	9123	Excellent	E	Excellent	Abilene via vBNS+	
MA, MIT	ICESAT	6378	6378	6692	GSFC-ICESAT	71202	43059	Excellent	E	Excellent	Abilene via NISN / MAX	
MD, UMD-College Park	MODIS	2011	2025	2039	GSFC-MAX	125042	103640	Excellent	E	Excellent	Direct Fiber	
MD, NOAA-NESDIS	CERES, AMSR-E	1509	1513	1517	NSIDC	2056	544	Adequate	A	Adequate	Abilene via FRGP, MAX	
MT, Univ of Montana	MODIS	675	747	819	EDC DAAC	17388	6927	Excellent	E	Excellent	Abilene via vBNS+	
NM, LANL	MISR	1033	1033	1033	LaRC DAAC	8216	1248	GOOD	E	GOOD	NISN -> ESNet via CA	
NY, SUNY Stony Brook	CERES	558	566	573	LaTIS	25906	15439	Excellent	E	Excellent	NISN -> Abilene via Chicago	
OH, Ohio State Univ	ICESAT	5678	5678	5992	GSFC-ICESAT	57068	5231	Adequate	G	Adequate	Abilene via NISN / MAX	
OR, Oregon State Univ	CERES, MODIS	6292	6929	7570	LaTIS	23876	14557	GOOD	G	GOOD	NISN -> Abilene	
PA, Penn State	MISR	2642	2642	2642	LaRC DAAC	26752	20023	Excellent	E	Excellent	NISN -> Abilene	
TX, Texas A & M	AMSR-E	1200	1200	1200								
TX, U Texas-Austin	ICESAT	10430	10430	10745	GSFC-ICESAT	38814	17310	GOOD	G	GOOD	Abilene via NISN / MAX	
VA, LaRC - SAGE III MOC	SAGE III	200	200	200	GSFC-CSAFS	6680	3920	Excellent	E	Excellent	NISN SIP	
WA, NOAA PNNL	MISR	1442	1442	1442	LaRC DAAC	14442	4970	Excellent	G	Excellent	NISN -> ESNet via Chicago	
WA, U Washington	ICESAT	11003	11003	11374	GSFC-ICESAT	43436	17126	GOOD	G	GOOD	Abilene via NISN / MAX	
WI, U of Wisc.	MODIS, CERES, AIRS	13114	14788	16461	GDAAC	43736	18615	GOOD	G	GOOD	Abilene via MAX	
Brazil, INPE	HSB	1024	1024	1024	GSFC-MAX	691	348	LOW	L	LOW	Abilene -> AMpath-> ANSP	
Canada, U. of Toronto	MOPITT	612	612	612	LaRC DAAC	1426	1176	GOOD	G	GOOD	NISN T1	NISN-CA*net4
France, Palaiseau	CERES	205	206	206								
Italy, Ispra (JRC)	MISR	517	517	517	LaRC DAAC	3202	1247	GOOD	E	GOOD	NISN-UUNET-Milan	
Netherlands (KNMI)	OMI	0	1024	1024	GSFC-MAX	37992	29687	Excellent	E	Excellent	Abilene --> Chi -> Surfnet	
Russia, Moscow (CAO)	SAGE III	26	26	26	CAO-->LaRC-N	158	144	Excellent	E	Excellent	NISN -> Moscow	
UK, Oxford	HIRDLS	0	512	512	GSFC-MAX	4119	3755	Excellent	E	Excellent	Abilene->JAnet (NY)	
UK, London (UCL)	MISR, MODIS	1033	1033	1033	LaRC DAAC	18262	3521	Excellent	A	Excellent	Abilene->JAnet (NY)	

*Rating Criteria:	
Excellent	Median of Daily worst hours >= 3 *Requirement
GOOD	Median of Daily worst hours >= Requirement
Adequate	Median of Daily worst hours < Requirement <= Median of Daily Medians
LOW	Requirement > Median of Daily Medians
BAD	Requirement > 3 * Median of Daily Medians

Rating	Current Oct-03	Last Month	Future: May-04
Excellent	15	15	14
GOOD	10	9	11
Adequate	4	6	4
LOW	2	2	2
BAD	0	0	0
Total	31	32	31
GPA	3.23	3.16	3.19

EOS QA SCF Sites
Daily Median and Worst Performance as a percent of Requirements



Details on individual sites:

Each site listed below is the DESTINATION for all the results reported in that section. The first test listed is the one on which the rating is based -- it is from the source most relevant to the driving requirement. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

1) AL, NSSTC (UAH) (aka GHCC)

Rating: Continued **Good**
Teams: CERES, AMSR
Domain: nsstc.uah.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC LaTIS	9.7	9.6	8.1	NISN SIP
GSFC	21.4	20.8	17.6	NISN SIP

Requirements:

Source Node	Date	mbps	Rating
LaRC LaTIS	FY'03	2.6	Good
LaRC LaTIS	Oct '03	4.9	Good
LaRC LaTIS	May '04	6.2	Good

Comments: Thruput from LaTIS dropped from about 13 mbps stable to the above values in mid January, but the daily worst increased. This increase combined with the increased FY '04 requirement to leave the rating "Good". Thruput from GSFC has been stable since April '03.

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2) AZ, Tucson (U of AZ):

Rating: ↓ Excellent → **Good**
Teams: MODIS
Domain: arizona.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC LPDAAC	24.6	14.8	5.1	Abilene via vBNS+ / Chicago
GSFC	11.5	9.7	7.5	Abilene via MAX
LaRC DAAC	26.3	25.9	13.0	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
EDC LPDAAC	'03, '04	2.8	Good

Comments: The ratings are based on the MODIS flow from EDC (There is no longer a requirement from LaRC, as the MISR team has all moved away from Arizona).

Performance dropped from EDC and LaRC In early January (EDC had previously averaged about 25 mbps, LDAAC 30); but thruput from GSFC was stable. The rating from EDC drops to "Good"

3) CA, JPL:

Ratings: GSFC: Continued **Low**
LaRC: Continued **Adequate**

Teams: MISR, AIRS, TES, MLS, ASTER
Domain: jpl.nasa.gov
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC → MISR	39.3	38.0	15.5	EMSnet
GSFC DAAC → AIRS	17.6	9.2	1.1	NISN SIP
GSFC → MISR	12.8	12.2	9.9	NISN PIP

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03 - '04	18.5	Adequate
GSFC DAAC	'03, 04	17.6, 24.8	Low

Comments:. Thruput from L-DAAC to JPL-MISR has been stable via EMSnet since July '03. The median daily worst remains below the requirement, so the rating remains "Adequate".

Testing to AIRS is from GDAAC, and uses SIP. Thruput from GDAAC to JPL-AIRS has been generally steady since September '02. The daily median is still below the requirement, thus a FY'02-'04 rating of "LOW". The low value for the daily worst indicates that there is considerable congestion in this path.

Testing from the GSFC campus to JPL has been routed via NISN PIP since September '02, with very steady performance.

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4) CA, RSS: (Santa Rosa):

Ratings: Adequate → N/A

Teams: AMSR
Domain: remss.com
Web page: http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
JPL PODAAC	(Testing stopped November '03)			NISN SIP: 2 x T1

Requirements:

Source Node	FY	kbps	Rating
JPL PODAAC	'03, '04	1156, 1926	N/A

Comments: Performance testing stopped in early November, when the test host went down; a new host is being sought. Previously, thruput had been very stable since August '02, rated "Adequate", as good as can be expected from a pair of T1s.

Note: RSS also has a requirement to flow data to NSSTC (see #1). This is not tested yet. The requirement is 900 kbps in FY '03, but grows to 3.1 mbps in FY'04 and 4.4 mbps in FY'05. While the FY'03 requirement is achievable with the 2 x T1 configuration, the FY'03 and '04 flows are not.

5) CA, UCSB:

Ratings: GSFC: Continued **Excellent**
EDC: Continued **Excellent**

Teams: MODIS
Domain: ucsb.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	22.1	18.4	15.8	Abilene via NISN / MAX
EDC-LPDAAC	32.9	24.3	10.1	Abilene via vBNS+ / Chicago

Requirements:

Source Node	FY	mbps	Rating
GSFC-DAAC	'03, '04	2.7, 2.9	**Excellent**
EDC-LPDAAC	'03, '04	1.9, 2.1	**Excellent**

Comments: The requirements are split between EDC and GSFC. Performance from both GSFC and EDC is very steady. The rating remains "Excellent" from both sources.

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6) CA, UCSD (SIO):

Ratings: GSFC: Continued **Good**
LaTIS: Continued **Excellent**

Teams: CERES, ICESAT
Domain: ucsd.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCSD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	74.6	47.2	18.4	Abilene via NISN / MAX
LaTIS	26.4	25.5	21.1	Abilene via NISN / Chi

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03 - '04	6.5	**Good**
LaTIS	'02 - '04	0.26	**Excellent**

Comments: The rating is based on testing from the ICESAT SCF at GSFC. Performance improved again at the end of November from ICESAT (median from ICESAT was about 30 mbps before that). The daily worst is slightly below 3 x the requirement, so the rating remains "Good".

Performance from LaTIS has been stable since the LaTIS test node was restored on 30 April '03 – the median prior to that was 13.5 mbps. The CERES requirements are much lower than ICESAT, so the LaTIS rating continues as "Excellent".

7) CO, Colo State Univ.: Rating: Continued **Adequate**

Teams: CERES Domain: colostate.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/COLO_ST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	4.34	4.15	1.89	Abilene via NISN / Chicago
GSFC	7.14	6.97	4.83	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'03, '04	1.95, 2.05	**Adequate**

Comments: Performance from both LaTIS and GSFC has been pretty stable since December – before that it was noisy since mid June. The daily worst is now a bit below the requirement for '03 through '04, so the rating remains "Adequate". Performance from GSFC would rate as "Good".

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8) CO, NCAR: Ratings: LaRC: Continued **Excellent**

GSFC: Continued **Excellent**

Teams: MOPITT, HIRDLS
Domain: scd.ucar.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	19.4	17.0	10.2	Abilene via NISN / Chicago
GSFC-MAX	46.3	43.4	33.7	Abilene via MAX
EDC	54.2	41.8	21.2	Abilene via vBNS+ / Chicago
ARC	45.8	31.3	22.5	Abilene via CalRen

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03, '04	2.4, 2.4	**Excellent**
GSFC	'03, '04	2.6, 3.1	**Excellent**

Comments: Performance from LaRC DAAC was stable. The median daily worst remains above 3 x the requirement, so the rating remains "Excellent"".

Performance from GSFC, ARC and EDC all dropped last year, from about 70-90 to 45 mbps, due to TCP slow rampup. At that time, however, performance from "GSFC-ESTO" was unaffected, staying at about 90 mbps. But when "GSFC-ESTO" was switched from a fast-E interface to a GigE interface on 24 July, the slow TCP rampup was then observed, dropping performance. Performance from NASA Ames dropped when the tests were switched to a GigE host. Strange...it looks like maybe when the source host is on GigE interface, but the destination is FastE, a TCP stack anomaly is created. Still under investigation.

9) FL, Univ. of Miami:

Rating: GSFC: ↑ Adequate → **Excellent**
LaRC: Continued **Excellent**

Teams: MODIS, MISR
Domain: rsmas.miami.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/MIAMI.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	190.4	148.8	55.3	Abilene via MAX
GSFC-MAX	264.0	198.8	75.0	Abilene via MAX
LaRC DAAC	26.8	26.4	18.6	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03 , '04	15.1, 17.0	**Excellent**
LaRC DAAC	'03 - '04	1.1	**Excellent**

Comments: Thruput from GDAAC improved dramatically in late November '03, due to the GDAAC firewall upgrade. It is now rated "Excellent".

Performance from LaRC DAAC has been stable since May '03, also rating "Excellent".

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10) MA, Boston Univ:

Ratings: EDC: Continued **Excellent**
LaRC: Continued **Excellent**

Domain: bu.edu
Teams: MODIS, MISR
Web Page: http://ensight.eos.nasa.gov/Missions/terra/BU.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC DAAC	49.2	29.0	9.1	Abilene via vBNS+ / Chicago
GSFC	91.2	85.4	49.0	Abilene via MAX
LaRC DAAC	26.7	26.5	17.1	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
EDC DAAC	'03, '04	2.0, 2.3	**Excellent**
LaRC DAAC	'03 - '04	1.2	**Excellent**

Comments: Performance from EDC ijs noisy but steady, but remains well above the requirement, so the rating continues to be "Excellent".

Performance from LaRC remains stable. The LaRC requirement is small, so the rating continues to be "Excellent".

Performance from GSFC has been stable since June '03.

11) MA, MIT:

Rating: Continued **Excellent**

Teams: ICESAT
Domain: mit.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/MIT.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	82.2	71.2	43.1	Abilene via NISN / MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03-'04	6.4	**Excellent**

Comments: Performance from GSFC to MIT has been very stable at the above values since November '03; previously, the median was about 50 mbps. The rating remains "Excellent".

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12) MD, NOAA-NESDIS (Camp Springs)

Rating: Continued **Adequate**

Teams: CERES, AMSR-E
Domain: nesdis.noaa.gov
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/NOAA_Camp_Springs.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
NSIDC	10.5	2.1	0.5	FRGP / Abilene / MAX
LATIS	12.3	7.6	2.1	
GSFC-SEN	29.4	18.0	5.7	Peering at MAX

Requirements (QA only):

Source Node	FY	mbps	Rating
NSIDC	'02 – '04	1.51	**Adequate**
LATIS	'02 – '04	0.21	**Excellent**

Comments: The Best:Worst ratio is 5-6:1 from LaTIS and GSFC; this is indicative of congestion at NOAA. But the higher 21:1 ratio from NSIDC indicates there is also congestion at NSIDC. The median daily worst from NSIDC is below the requirement, thus a rating of "Adequate". There is less noise from LaTIS, and a lower requirement; rating "Excellent".

13) MD, Univ. of Maryland:

Rating: Continued **Excellent**

Teams: MODIS
Domain: umd.edu
Web Pages: http://ensight.eos.nasa.gov/Missions/terra/UMD_SCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX	128.3	125.0	103.6	Direct Fiber OC-12 / MAX / SCF
EDC	127.6	97.3	31.2	VBNS+ / Abilene / MAX / SCF
NSIDC	91.1	90.1	55.0	Abilene / MAX / SCF

Requirements (QA only):

Source Node	FY	mbps	Rating
GSFC DAAC	'02 – '04	2.0	**Excellent**

Comments: Performance from GSFC-MAX dropped back to the 125 mbps level in Mid December – had sometimes been stable at 152 mbps before that. Somewhat noisy but long term stable from EDC; daily worst increased from 15 mbps last year. Thruput from NSIDC increased from 30 mbps typical in November.

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14) MT, Univ of Montana:

Rating: Continued **Excellent**

Teams: MODIS
Domain: ntsg.umt.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/MONT.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC LPDAAC	18.1	17.4	6.9	VBNS+ / Chi / Abilene
GSFC	39.9	36.0	24.4	MAX / Abilene
NSIDC	40.2	33.6	17.1	CU / FRG / Abilene

Requirements:

Source Node	FY	kbps	Rating
EDC LPDAAC	'03, '04	675, 747	**Excellent**

Comments:. Thruput dropped from EDC in October '03 – had been similar to the other nodes before that. But with the low requirements, the rating continues as "Excellent". Stable performance from other sources

15) NM, LANL:

Rating: ↓ Excellent → **Good**

Teams: MISR
Domain: lanl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/LANL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	14.98	8.22	1.25	NISN SIP / MAE-W (Ames) / ESnet
GSFC	12.66	8.00	2.01	MAX / ESnet

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'04	1.03	Good

Comments: Performance from both LDAAC and GDAAC a bit more short term variable but long term stable. The daily worst is now below 3 x the requirement, so the rating drops to "Good".

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16) NY, SUNY-SB:

Rating: Continued **Excellent**

Teams: CERES, MODIS
Domain: sunysb.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/SUNYSB.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	27.1	25.9	15.4	NISN SIP / MAX / Abilene / NYSERnet
GSFC	50.9	39.4	21.9	MAX / Abilene / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'02-'04	0.56	Excellent

Comments: Performance from LaTIS improved in October '03 (from 14 to 40 mbps for LaTIS), but dropped to the above values in January. From GSFC performance has been somewhat variable (but usually better than from LaTIS). With the low requirement, the rating remains "Excellent".

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17) OH, Ohio State Univ:

Rating: ↓ Good → **Adequate**

Teams: ICESAT
Domain: ohio-state.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/OHIO_STATE.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	78.5	57.1	5.2	Abilene via NISN / MAX
GSFC-MAX	60.9	56.4	37.1	Abilene via NISN / MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03 - '04	5.7	Adequate

Comments: Performance has been quite noisy from ICESAT, but stable from GSFC-MAX, indicating congestion inside GSFC at GSFC-ICESAT. The median daily worst is now below the requirement; dropping the rating to "Adequate"; would be rated "Excellent" from MAX.

18) OR, Oregon State Univ:

Ratings: LaTIS: Continued **Good**
GSFC: Continued **Excellent**

Domain: oce.orst.edu
Teams: CERES, MODIS
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	26.1	23.9	14.6	Abilene via NISN / Chicago
JPL	26.4	19.3	13.3	Commodity Internet
GSFC	32.9	24.9	9.0	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'03, '04	6.1, 6.9	**Good**
GDAAC	'02 - '04	0.20	**Excellent**

Comments: Performance from all nodes increased in November (e.g., LaTIS median was 14 mbps, 8.4 from GSFC), clearly due to changes near ORST; rating remains "Good". From JPL, route via Commodity internet since June '03 – switched back to CENIC in March '04.

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19) PA: Penn State Univ:

Rating: Continued **Excellent**

Teams:MISR
Domain: psu.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	27.0	26.8	20.0	Abilene via NISN / MAX
GSFC	76.8	76.5	57.5	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'04	2.6	**Excellent**

Comments: Performance from LDAAC stable and less noisy; median dropped from 40 mbps in Jan '04; the rating remains "Excellent". Performance from GSFC has been extremely stable since Feb '04.

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20) TX: Univ. Texas - Austin

Rating: Continued **Good**

Teams: ICESAT
Domain: utexas.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	43.5	38.8	17.3	Abilene via NISN / MAX
GSFC-MAX	44.5	44.4	43.2	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03-'04	10.4	**Good**

Comments: Performance from GSFC-MAX and ICESAT-SCF at GSFC via Abilene has been very stable since July '03; some congestion indicated at ICESAT. The rating remains "Good".

21) VA, LaRC: SAGE III MOC: Rating: Continued **Excellent**

Teams: SAGE III Domain: larc.nasa.gov
Web Page: http://ensight.eos.nasa.gov/Missions/sage/SAGE_MOC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-SAFS	7.02	6.68	3.92	NISN SIP

Requirements:

Source Node	FY	mbps	Rating
GSFC SAFS	'02 – '04	0.20	**Excellent**

Comments: Stable thruput since upgrade of LaRC MOC machine in Feb '03 (median was 3.9 mbps with old host).

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22) WA, Pacific Northwest National Lab: Rating: ↑ Good → **Excellent**

Teams: MISR Domain: pnl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/PNNL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	14.8	14.4	5.0	ESnet via NISN - Chicago
GSFC	18.7	18.4	17.6	ESnet via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'04	1.4	**Excellent**

Comments: Performance from LaRC to PNNL got a bit less noisier in September '03, now with a 3:1 ratio between typical daily best and worst (was 5:1 previously). The median daily worst is again above 3 x the requirement, so the rating improves back to "Good". Thruput improved from GSFC in Jan '04, due to improved ESnet peering at MAX.

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23) WA, Univ Washington: Rating: Continued **Good**

Teams: ICESAT Domain: washington.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/UW.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	75.9	43.4	17.1	Abilene via NISN/MAX
GSFC-MAX	70.0	69.3	48.7	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02 – '04	11.0	**Good**

Comments: Performance from ICESAT-SCF at GSFC is quite a bit noisier than from GSFC-MAX. The median daily worst is above the requirement; the rating remains "Good" – would be "Excellent" from GSFC-MAX.

24) WI, Univ. of Wisconsin:

Ratings: GSFC: Continued **Good**
LARC: Continued **Adequate**

Teams: MODIS, CERES, AIRS
Domain: ssec.wisc.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/WISC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
G-DAAC	47.3	43.7	16.6	MAX / Abilene / Chi / MREN
LaTIS	12.6	9.3	3.2	NISN / Chicago / MREN
GSFC-MAX	57.8	51.8	37.4	MAX / Abilene / Chi / MREN
GSFC-NISN	16.5	16.4	14.6	NISN / Chicago / MREN

Requirements:

Source Node	FY	mbps	Rating
GSFC	'03, '04	13.1, 14.8	Good
LaRC Combined	'03, '04	6.8, 7.5	Adequate

Comments: Performance from GDAAC improved in November '03, due to GSFC ECS firewall upgrade. The GSFC rating is now based on this source, since MODIS flows are sent from GDAAC; the rating continues at "Good". Other sources have been generally stable since March '03, with somewhat reduced noisiness. The rating from LaRC remains "adequate".

The site rating is based on the larger GSFC requirement, and therefore remains "Good".

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25) Brazil, INPE:

Rating: Continued **Low**

Team: HSB
Domain: inpe.br
Web Page: http://ensight.eos.nasa.gov/Missions/aqua/INPE_HSB.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	1.19	0.69	0.35	MAX / Abilene / AMPATH / ANSP
GSFC	0.68	0.35	0.11	NISN / GBLX / ANSP

Requirements: (2 ISTs only)

Source Node	FY	mbps	Rating
GSFC EOC	'02 – '04	1.02	Low

Comments: Testing via two routes: commodity internet (GBLX), and AMPATH. Performance has been stable on both routes since August '03. Rating remains "Low".

26) Canada, Univ of Toronto:

Rating: Continued **Good**

Team: MOPITT
Domain: physics.utoronto.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	1.43	1.43	1.18	NISN / GSFC / T1
LaRC DAAC	16.1	13.7	7.2	NISN / Chicago / CA*net4
GSFC	1.43	1.43	1.23	NISN / T1
GSFC	13.9	13.6	11.7	MAX / Abilene / Chicago / CA*net4

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 - '04	100	**Excellent**
GSFC EOC	'02 - '04	512	**Good**
Combined	'02 - '04	612	**Good**

Comments: Performance from both LDAAC (Source of QA data) and GSFC (Source for IST) via NISN dedicated T1 is very steady. Since both flows are combined together on the T1, the performance compared to the combined requirement rates as "Good".

Performance via CA*net4 from GSFC has dropped from 25-30 mbps in October '03. Performance from LaRC via NISN / Chicago / CA*net4 / ONet increased to comparable levels in January '04. Both changes are likely attributed to CA*net peering changes. Ratings via this path from either source would be "Excellent".

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27) Italy, EC - JRC:

Rating: ↓ Excellent → **Good**

Teams: MISR
Domain: ceo.sai.jrc.it
Web Page: http://ensight.eos.nasa.gov/Missions/terra/JRC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	3.31	3.20	1.25	NISN / UUnet / Milan
GSFC-NISN	3.50	3.31	1.59	NISN / UUnet / Milan

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 – '04	517	**Good**

Comments: Performance basically stable from both sources since July '03, but the daily worst from LaRC dropped below 3 x the requirement, dropping the rating to "Good".

28) Netherlands, KNMI:

Rating: Continued **Excellent**

Teams: OMI
Domain: nadc.nl
Web Pages: http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX → OMI PDR Server	39.4	38.0	29.7	MAX / Abilene/ Chi / Surfnet
GSFC-MAX → KNMI Test Node	92.3	92.2	92.1	MAX / Abilene/ Chi / Surfnet
GSFC-NISN → KNMI Test Node	30.3	14.1	1.3	NISN / Chi / Surfnet

Requirements: (2 ISTs Only)

Source Node	FY	Mbps	Rating
GSFC	'04	1.02	**Excellent**

Comments: Performance via Abilene and Surfnet is very stable to both the OMI PDR server and KMNI Test node. This is exceptionally good performance for US to Europe!

However, the NISN route exhibits lower performance and significant noisiness. Therefore, it is important that all servers at GSFC which communicate with KNMI have access to MAX.

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29) Russia, CAO (Moscow):

Rating: Continued **Excellent**

Teams: SAGE III
Domain: mipt.ru
Web Pages: http://ensight.eos.nasa.gov/Missions/sage/CAO.shtml
http://ensight.eos.nasa.gov/Missions/sage/LARC_SAGE.shtml

Test Results:

Source → Dest	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
CAO → LaRC	158	158	144	MIPT / TCnet / NISN SIP
CAO → LaRC	1222	1188	552	Commodity Internet
LaRC → CAO	159	139	116	NISN SIP / TCnet / MIPT
LaRC → CAO	1474	1198	471	Commodity Internet

Requirements:

Source → Dest	FY	kbps	Rating
CAO → LaRC	'02 – '04	26	**Excellent**
LaRC → CAO	'02 – '04	26	**Excellent**

Comments: Performance testing running since November '02, with dual routes. Performance on the NISN dedicated circuit to Moscow, then TCnet (NASA Russian ISP) tunnel to CAO ISP (MIPT) is extremely steady in both directions, with a rating of "Excellent".

Note: On approx 1 October 2003, the CAO ISP was reconfigured. At that time, the NISN route was disabled. The NISN route was restored approx 1 December.

The dual route configuration also allows testing via the commodity internet route. Performance via that route is much better, but is also more variable, and also would rate "Excellent".

30) UK, London: (UCL SCF)

Rating: ↑ Adequate → **Excellent**
Teams: MODIS, MISR
Domain: ucl.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	19.7	18.3	3.5	NISN / Level3 (San Jose) / London
GSFC MAX	49.4	49.3	44.4	MAX / Abilene / NY / JAnet

Requirements

Source Node	FY	mbps	Rating
LaRC DAAC	'02 – '04	1.03	**Excellent**

Comments: Route from LDAAC switched to NISN / Level3 peering in San Jose in approx January '04 – previously the route was via NISN to STARTAP in Chicago, then CA*Net4 to NY, then JAnet to London; performance was a noisy 5 mbps. The rating on this route is now "Excellent".

Performance from GSFC remains very stable and much higher than the NISN / Level3 route.

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31) UK, Oxford:

Rating: Continued **Excellent**
Teams: HIRDLS
Domain: ox.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
GSFC	4134	4119	3755	MAX / Abilene / NY / JAnet

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 – '04	512	**Excellent**

Comments: Very steady performance continues since May '03, rating "Excellent" compared to the IST requirement.

Test Results to other EOS HIRDLS UK Sites (Requirements TBD):

Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC → RAL	32.8	26.9	10.5	MAX / Abilene / NY / JAnet

Comments: Thruput to RAL remains somewhat noisy, but quite good, with occasional step changes. The most recent change was an improvement from a median of 11 mbps in November '03.